

tis; in 25, chronic oophoritis; in 23, ovarian tumours; in 12, uterine polypi; in 6, fibroid tumours on the uterus; in 9, hypertrophy of this organ; in 1, elephantiasis of the external genitals; in 6, no morbid condition was to be discovered; 16 anteflexions were complicated; 1 with irritation of the pudenda, 4 with chronic endometritis, 5 with chronic oophoritis, 3 with tumour of the ovary, 1 with polypus of the uterus, 2 with hypertrophy of the uterus; 13 retroflexions were complicated: 1 with irritation of the pudenda, 6 with chronic endometritis, 2 with chronic oophoritis, 2 with tumour of the ovary, 1 with fibroid tumour of the uterus, 1 with elephantiasis of the pudenda; 10 anteversions were combined; 2 with irritation of the pudenda, 3 with chronic endometritis, 2 with tumour of the ovary, 1 with polypus of the uterus, 2 with hypertrophy of the uterus; 1 retroversion was combined with chronic oophoritis.—*Med. Times and Gaz.*, Oct. 16, from *Monatschrift für Geburtshkunde und Frauenerkrankheiten*, Nov., 1856.

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### MEDICAL JURISPRUDENCE AND TOXICOLOGY.

45. *On the Ligature of the Oesophagus in Animals in Toxicological Experiments.*—A discussion has lately taken place among the members of the French Academy of Medicine, on the ligature of the oesophagus in dogs, as a means of preventing vomiting after the ingestion of chemical substances, and as a measure consequently indispensable to the study of the physiological action of these substances upon animals.

It is a well known fact, that the principal conquests of toxicology have been achieved by this kind of experimentation, and that the greater part of Orfila's experiments were made under the protection of the previous operation in question. But how did the illustrious professor, whose labours have for so many years exercised universal influence over forensic medicine, perform the ligature of the oesophagus? It is a secret which would appear to be totally lost, so different would the results he arrived at seem to be from those spoken of by our present experimentalists.

Unhappily, Orfila has not, in his works, sufficiently explained his *modus operandi*, and he has barely escaped paying the penalty of the omission with his glory. What is known is, that the eminent professor made a *puncture in the oesophagus*, for the purpose of introducing into the stomach the substance, the action of which he desired to study, and that he then tied this duct below the artificial aperture, with a *tolerably large and moderately tight ligature*. We likewise read the following, on the effects of this operation, in his *Treatise on Toxicology*, p. 46:—

"It is proved by fifty experiments, several of which have been publicly made before a numerous audience, and in presence of several members of the Academy of Medicine, that if the oesophagus, after having been isolated, is tied, and if the ligature is preserved for twenty-four or thirty-six hours, the animals thus operated on merely feel slight depression and a moderate amount of feverishness. As soon as the ligature is removed, the dogs drink, soon begin to eat, and are perfectly restored to health."

Whether, however, dogs die, or not, from the wound made in the oesophagus, after the first eight-and-forty hours, is unimportant; the end was attained, and there was no reason for investigating the effects of a permanent ligature, which is useless in toxicology. What Orfila sought by a ligature of the oesophagus he obtained—the possession of a preservative means by which chemical substances might be retained in the stomach without itself occasioning symptoms which might be confounded with those resulting from the introduction of these substances, or capable of causing poisonous properties to be ascribed to a harmless substance.

Now, after an affirmation so positive as the one we have just quoted, and which the learned world had generally accepted as gospel truth, the surprise of the Academy will be readily imagined when, two years since, two Professors of

the Veterinary School of Alfort, Messrs. Bouley and Reynal, came forward with assertions diametrically opposed to Orfila's. Messrs. Bouley and Reynal sought to prove that the deligation of the œsophagus, far from being perfectly harmless, is generally attended with serious consequences; that it is almost invariably mortal, when the ligature remains permanently applied, since it is capable of causing death in a short time, by the sole agency of the disturbances it occasions in the system, and so much the more rapidly that the substances ingested more powerfully excite vomiting; that, in short, it is almost always followed, a short time after its application, by grave symptoms, which must be taken into consideration in the appreciation of the phenomena observed when the effects of substances ingested into the stomach are investigated.

The importance of a communication which shook all Orfila's toxicological edifice did not admit of indifference, and the Academy appointed a committee to resume and control the experiments of the Professors of Alfort, and the report of this committee was read by Dr. Rousseau on the 29th July last.

In this remarkable production, Dr. Rousseau successfully examined the two principal questions of fact and of interpretation. It was first necessary to ascertain whether the ligature of the œsophagus is simple and harmless, as Orfila declared it to be, or whether it is attended with serious disturbance, as Messrs. Bouley and Reynal assert. Further experiments were made at the Hospital of Val-de-Grâce. Messrs. Bouley and Reynal performed anew the ligature of the œsophagus on five dogs, carefully avoiding to comprise the nervous filaments in the loops. Notwithstanding this precaution, extreme agitation, retchings, and nervous disturbance, were observed in the animals, and these symptoms singularly contrasted with the mere depression spoken of by Orfila. The temporary ligature, however, killed but one dog out of thirty-one. The permanent ligature, as was to be expected, was fatal to twenty-two dogs out of twenty-three. The greater part of these animals died from the third to the sixth day.

The most important question of the debate was to ascertain whether the fatal results of ligature of the œsophagus, after the ingestion into the stomach of substances subjected to experimentation, might not be the consequence of the combined action of the ligature of the œsophagus and the necessarily powerless efforts to reject these substances, even when not possessed of poisonous properties. This fact seemed confirmed by the death of a certain number of dogs that had taken, before the operation, from one to three drachms of sea-salt, of sulphate of zinc, of nitrate of bismuth, and even of lukewarm water. We will say nothing on the question of interpretation, it remained full of obscurity, and it is not precisely known why and how the victims of these experiments died under circumstances in which, according to Orfila's affirmations, they should have experienced scarcely more than discomfort, or some insignificant disturbance.

How deceptive or dangerous soever the results of experiments made on animals, in less practised hands than those of Orfila, may now be, we cannot admit that a man gifted in so high a degree with the talent of observation could have deluded himself for forty years, and have confounded the phenomena peculiar to the action of poisonous substances with those which owe their origin to the ligature of the œsophagus.

Dr. Cloquet, who witnessed several hundred experiments performed by the late Dean of the Faculty of Medicine (Orfila), proved, in a few words in the discussion, that the ligature of the œsophagus, performed with a thick and rather loose string, had never appeared to him to have the gravity now ascribed to it, and that Orfila knew perfectly well how to make allowance for the disturbance of functions peculiar to the operation. We may add that, after the vote on the conclusions of the report of the committee, which were considerably modified, on the motion of Dr. Derville, Dr. Velpeau expressed the regret that, before proceeding to a somewhat precipitate vote, the Academy did not take into consideration a letter from Dr. Nonat, in which this gentleman declares that a series of twenty-two experiments made by him fifteen years since, with Messrs. Sandras, Deville, and Guibourt, will convince any one who will read the details, that the ligature of the œsophagus has never occasioned any accidents of a nature to cast doubts upon the results of toxicological researches.

The upshot of these contradictory assertions is, in our estimation, a very posi-

tive fact, viz., that the ligature of the oesophagus was performed by Messrs. Bouley and Reynal, if not with less care, at least *otherwise* than by Orfila. The whole question here lies in the difference of the manner of operating. It is for experimentalists to investigate that of the master; but, in the mean time, we cannot see, in the conclusions of the report of the committee, matter important enough to assail the imperishable monument raised to the science of poisons by the great and noble mind of Orfila.—*Dublin Hosp. Gaz.*, Oct. 1, 1858, from *Journal of Pract. Med. and Surg.*

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#### MISCELLANEOUS.

46. *Ozonometer*.—Dr. LANKESTER exhibited to the Chemical Section of the British Association for the Advancement of Science, at its late meeting in Leeds, an instrument for measuring the constant intensity of ozone. This instrument consisted of two small rollers included in a box, which were moved by means of ordinary clockwork. Over the roller a strip of paper, prepared with iodide of potassium and starch is allowed to revolve, the paper becoming exposed to the air for an inch of its surface in the lid of the box. Twenty-four inches of paper pass over the rollers in the course of twenty-four hours, and thus registers, by its colour, the intensity of the action of ozone in the atmosphere. By this instrument, the intensity of the ozone for every hour in the twenty-four could be registered, and *minima* and *maxima*, with an average, ascertained. The register of ozone could also be compared with those of the anemometer, and the relation of ozone to the direction and force of the wind ascertained. Dr. Lankaster pointed out the importance of ascertaining the presence of ozone, on account of its undoubted relation to health. He drew attention to a series of tables which had been drawn up from the registrations of the anemometer made at London, Blackheath, and Felixstow, on the coast of Suffolk. From these it was seen that the relation of these three places was 0, 22, and 55. The instrument acted also as a clock, and the time could be accurately marked upon the ozonized paper.

Mr. MARSHALL made some remarks on his own observations during the last twelve months, and stated that he had not been able to discover, though assisted in the investigation by medical gentlemen, that there was any obvious connection between ozone and the state of health.—*British Med. Journ.*, Oct. 16, 1858.